



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,218	04/14/2005	Masanobu Seki	CU-4148 RJS	6993
26530 7590 12/16/2009 LADAS & PARRY LLP 224 SOUTH MICHIGAN AVENUE SUITE 1600 CHICAGO, IL 60604				
EXAMINER				
MAKI, STEVEN D				
ART UNIT		PAPER NUMBER		
1791				
MAIL DATE		DELIVERY MODE		
12/16/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/531,218

**Applicant(s)**

SEKI ET AL.

**Examiner**

Steven D. Maki

**Art Unit**

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 November 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 7-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 7-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/C)
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date 120909

1) A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11-30-09 has been entered.

2) The disclosure is objected to because of the following informalities: With respect to the after final amendment filed 11-30-09, which has been entered, "thet" on line 3 of the substitute paragraph 49 should be --the--.

Appropriate correction is required.

3) Claims 7 and 8 are objected to because of the following informalities: In claim 7 line 16, "forming" should be --foaming--. Appropriate correction is required.

4) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5) **Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art (specification page 1 lines 19-33, page 2 lines 1-12) in view of Sucech (US 5,643,510) and Japan (JP 10-330174) and further in view of Great Britain (GB 2,032,413) or Soviet Union (SU 1,252,322).**

The admitted prior art discloses a process for manufacturing a foamed gypsum board comprising:

blowing air into a foaming agent to form a **"preliminarily produced foam" (foam having bubbles);**

obtaining a foamed gypsum slurry by mixing the "preliminarily produced foam" into a kneaded material containing calcined gypsum, adhesive, additives and water;

pouring the foamed gypsum slurry into a space between upper and lower base papers;

passing the gypsum slurry covered with base papers through a shaping machine for determining the thickness and width of a gypsum board;

roughly cutting off the shaped strip-type gypsum board;

drying the rough cut gypsum board by passing it through a force drying machine;

cutting the dried gypsum board to a predetermined dimension.

The admitted prior art does not recite forming the preliminarily produced foam using a foaming agent and a pore size adjusting agent.

Sucech discloses controlling void size (and thereby improve nail pull and strength) in a foamed gypsum board by forming a "pregenerated foam" from a mixture of a first stable foaming agent such as alkyl ether sulfate and a second unstable foaming agent such as alkyl sulfate before adding the foam to the gypsum slurry to form a foamed gypsum slurry to be placed between upper and lower base papers. Sucech teaches mixing the two agents just prior to feeding them into the foam generator (col. 3 lines 17-18). Sucech et al teaches generating foam from a mixture of liquid foaming agent, air and water in a suitable foam generating apparatus (col. 1 lines 18-20).

Sucech teaches mixing the pregenerated foam with gypsum slurry (col. 5 lines 11-15). Thus, Sucech teaches mixing the first foaming agent and second foaming agent to form a mixture and then combining this mixture with air in a foam generating apparatus to form a foam and then adding the foam to the gypsum slurry. Sucech teaches using the second foaming agent to form unstable voids in the gypsum slurry to *obtain larger voids (bubbles in the gypsum core)* (e.g. Figure 5).

Japan teaches using a combination of foaming agent (e.g. alkyl ether sulfate) and foam controlling agent (e.g. higher fatty acid derivatives, alcohols or polyvalent metal sulfates such as ferric sulfate or aluminum sulfate) to control size of air cells in a gypsum slurry, improve adhesion of the core to the paper and improve strength. See paragraphs 1, 6 and 8-11 of USPTO translation. Japan teaches using 0.001 to 1.0 parts by weight of the foam controlling agent (foam adjusting agent). See claims 1 and 2 on page 2 of the USPTO translation. Japan teaches that large uniform cells are formed in the core. See paragraph 7 of USPTO translation and Figures 1 and 2. From a comparison of invention Figures 1 and 2 with comparison figures 3 and 4, it can be seen that the resulting pores in the gypsum board are relatively large. One of ordinary skill in the art would readily appreciate that a foam controlling agent (pore size adjusting agent) as disclosed by Japan improves foam stability and improves efficiency of foam production because it avoids formation of a large number of continuous pores (paragraph 6) while at the same time promoting joining of fine cell groups to form large cells (paragraph 7 of USPTO translation). Japan teaches using the foam controlling

agent (pore size adjusting agent) to *obtain uniform and comparatively big bubbles in the gypsum core* (e.g. Figure 2)

As to claim 1, it would have been obvious to one of ordinary skill in the art to obtain a **"foaming agent for producing foam having bubbles with desired sizes" ("pregenerated foam")** by preliminarily adding a "pore size adjusting agent" to a stock solution of foaming agent so that when such a "foaming agent for producing foam having bubbles with desired sizes" is used in the admitted prior art process to form "preliminary produced foam" ("pregenerated foam"), the manufactured gypsum board (plaster board) has pores with desired size distributed in a gypsum core in view of (1) Sucech's suggestion to control void size (and thereby improve nail pull and strength) in a foamed gypsum board by forming a "pregenerated foam" from a mixture of a first stable foaming agent such as alkyl ether sulfate and a second unstable foaming agent such as alkyl sulfate before adding the foam to the gypsum slurry to form a foamed gypsum slurry to be placed between upper and lower base papers and (2) Japan's teaching to use a **combination of foaming agent and foam controlling agent** to control size of air cells in a gypsum slurry (comparatively larger cells are shown in Figures 1, 2), improve adhesion of the core to the paper and improve strength.

Hence, The admitted prior art substantially discloses the claimed invention (including the rough cutting step) except for the use of two agents to form the pregenerated foam. Both Japan and Sucech teach the use of two agents in the production of a foamed gypsum board. When using two agents, Sucech motivates one

of ordinary skill in the art to mix the agents and then combine this mixture with air in a foam generating apparatus to form a foam and then add the foam to the gypsum slurry.

With respect to the type of "pore adjusting agent", it would have been obvious to one of ordinary skill in the art to use a pore adjusting agent such as sulfosuccinate type surface active agent (claim 7) or sodium hydroxide (claim 9) since (1) Great Britain, directed to foaming agent for cement (hydraulically settable inorganic material), suggests using a mixture comprising a first agent (e.g. alkyl sulfate or alkyl ether sulfate) and a second agent (i.e. alkali metal monoalkylolamido sulphosuccinate) to form a prefoam for making foamed cement having improved foam stability or (2) Soviet Union, directed to a foaming agent mixture for foamed gypsum slurry, teaches improving efficiency of foam production by 35% by mixing mono (5-15C) alkyl sulphates neutralized with sodium hydroxide (NaOH), sodium chloride (NaCl) and higher fatty acids.

With respect to amount of "pore size adjusting agent" (claims 8 and 10), it would have been obvious to add **0.00001 parts to 0.005 parts** by weight of a pore adjusting agent in view of (1) Japan's suggestion to obtain lightweight plaster board having improved adhesion of the core to the paper and improved strength by using an amount **0.001 parts to 1.0 parts** "foam controlling agent" (pore size adjusting agent) for controlling size of air cells in foaming agent for a gypsum slurry and (2) (A) Great Britain's above noted suggestion to use **sulphosuccinate** in a foaming agent mixture for a cement slurry to improve foam stability or (B) Soviet Union's suggestion to use **sodium hydroxide** in a foaming agent mixture for a gypsum slurry to improve efficiency

for foam production. The range of 0.001 to 1.0 disclosed by Japan overlaps the claimed range of 0.00001 to 0.005. It is noted again that one of ordinary skill in the art would readily appreciate that a foam controlling agent (pore size adjusting agent) as disclosed by Japan improves foam stability and improves efficiency of foam production because it avoids formation of a large number of continuous pores (paragraph 6) while at the same time promoting joining of fine cell groups to form large cells (paragraph 7 of USPTO translation).

#### Remarks

6) Applicant's arguments with respect to claims 7-10 have been considered but are moot in view of the new ground(s) of rejection.

7) No claim is allowed.

8) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is (571) 272-1221. The examiner can normally be reached on Mon. - Fri. 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven D. Maki/  
Primary Examiner, Art Unit 1791

Steven D. Maki  
December 11, 2009